



### NPD perspective

Joining Forces seminar 22-23 Mai 2013

**Eva Halland Project Manager FORCE** 

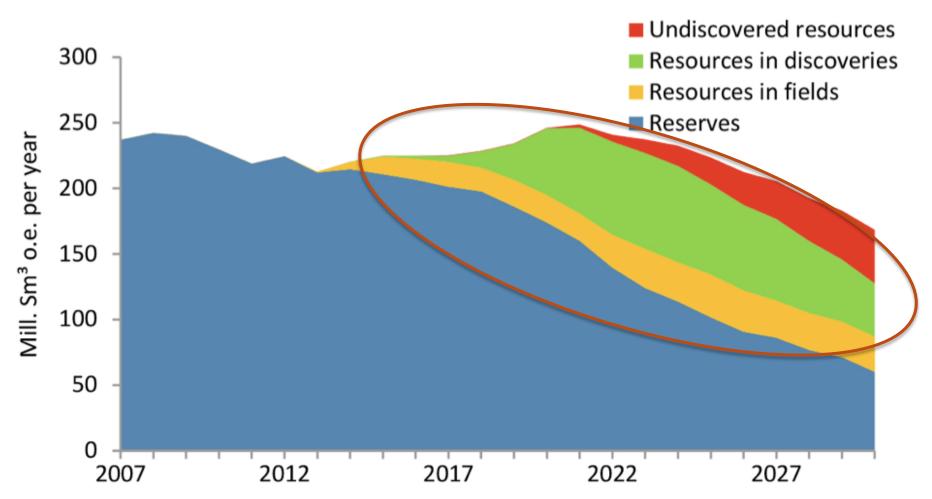




The Norwegian Petroleum Directorate will contribute in creating the greatest possible value for society from oil and gas activities by means of prudent resource management, based on safety, emergency preparedness and safeguarding the natural environment

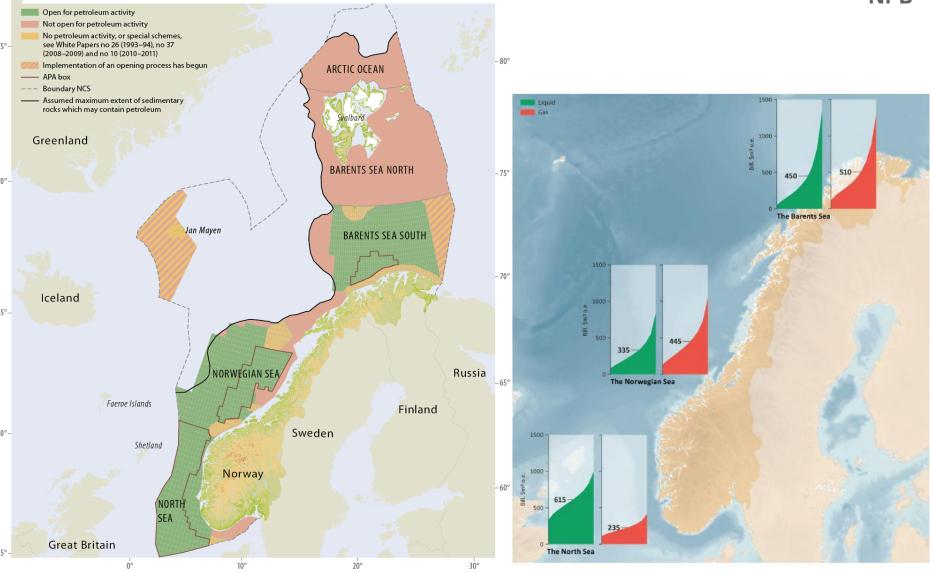
#### **Production prognosis** (2012)





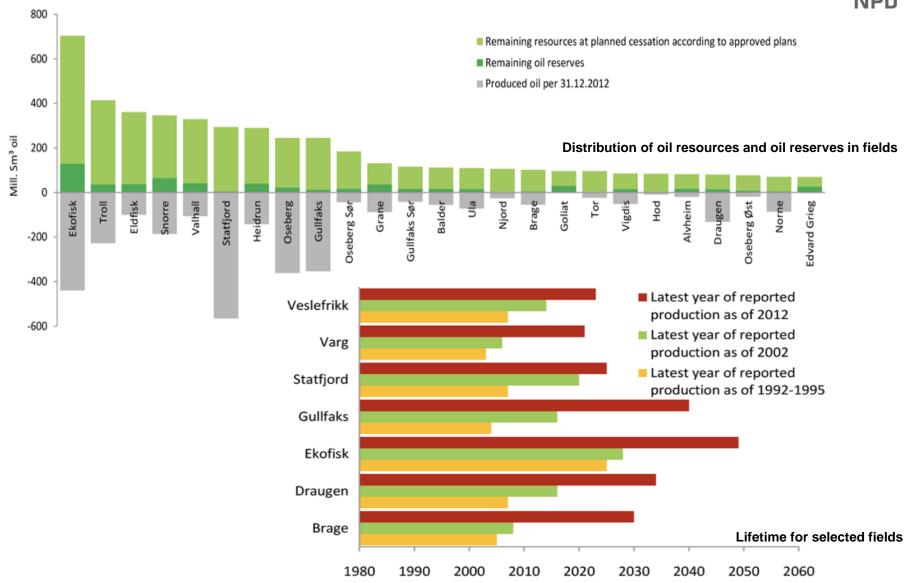
## Improved exploration «old areas and new areas» NEW IDEAS - NEW TECHNOLOGY





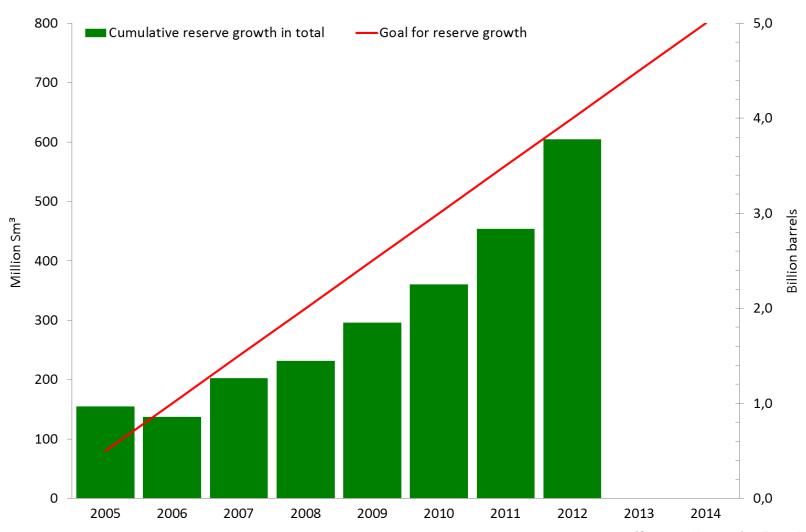
# Improved Recovery - «old fields and new fields» NEW IDEAS - NEW TECHNOLOGY





### Oil reserve growth

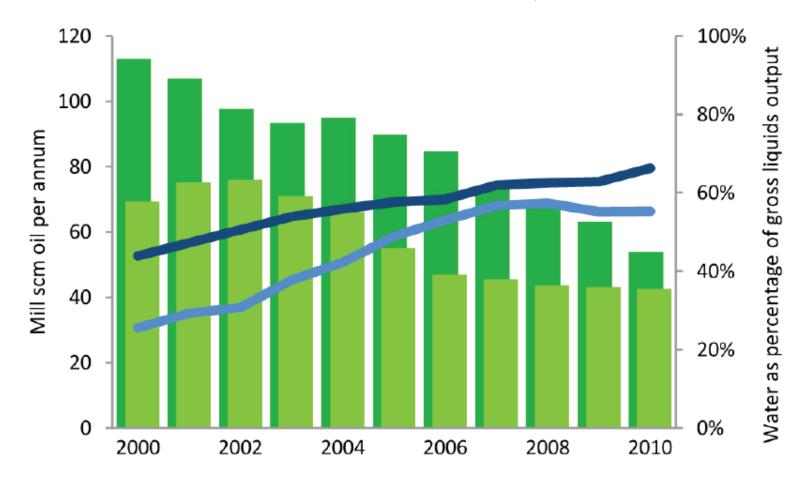




(Source: Norwegian Petroleum Directorate)

## Distribution of oil production and water cut from subsea wells and wells on fixed installations, 2000-2010

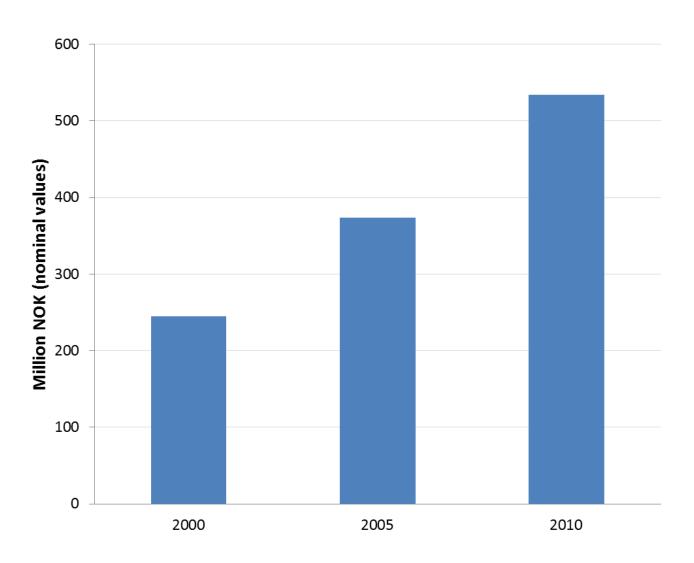




- Gross oil output from wells on fixed installations
- Gross oil output from subsea wells
- Water as percentage of total output from wells on fixed installations
- Water as percentage of total output from subsea wells

### Increasing drilling costs – a challenge





#### Technological developments - plenty to be proud of



#### Multiphase Flow



1991 TOGI Medium range gas

condensate

wellstream

transfer

1997

pumps

2000 Troll Lufeng Subsea

Subsea water removal and injection

1995

Statfjord sat

Medium range

oil wellstream

transfer

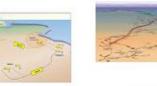




Asgard Complex subsea development; advanced flowline concepts

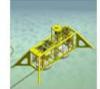






2007 Ormen Lange / Snøhvit Long range subsea to shore in deep / in "arctic"

subsea 2009 Tyrihans Subsea raw seawater 2007 injection (operation 2011)



injection, oil & gas boosting



2003

Mikkel

Long range

subsea to

Tordis

Subsea water

removal &





OLGA'

1986 Start Poseidon multiphase pump development





1987

Gullfaks

First subsea short oil

wellstream transfer

1996

Gullfaks First multiphase pumps (topsides,

part of Framo







1996

Troll

Long range

subsea to

shore gas

condensate

transfer

2003

Norne

Technology program

Subsea separation

concept

developments



Subsea Processing



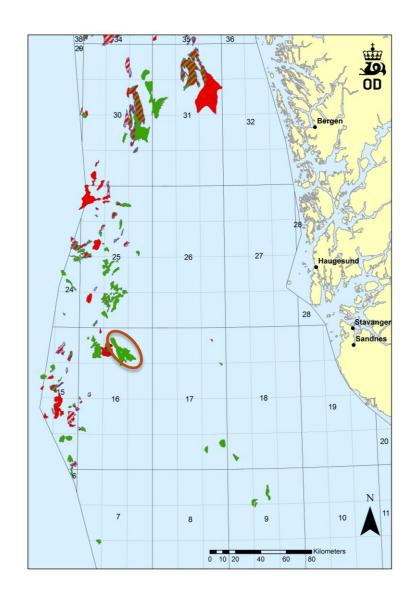
#### **EXPLORATION**

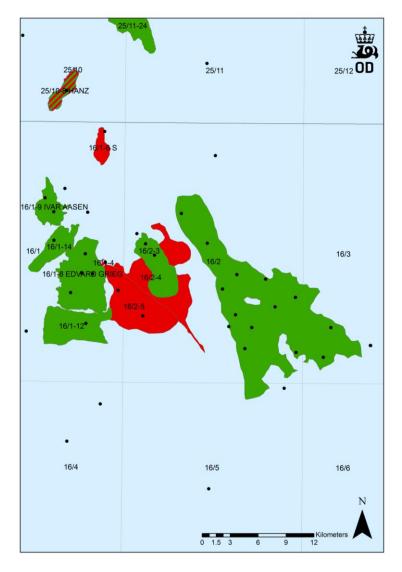
IOR TECHNOLOGIES have a proven technical and economic recovery potential

**EOR TECHNOLOGIES** have a promising, but unproven technical and economic recovery potential on reservoir and field level

#### **Johan Sverdrup**

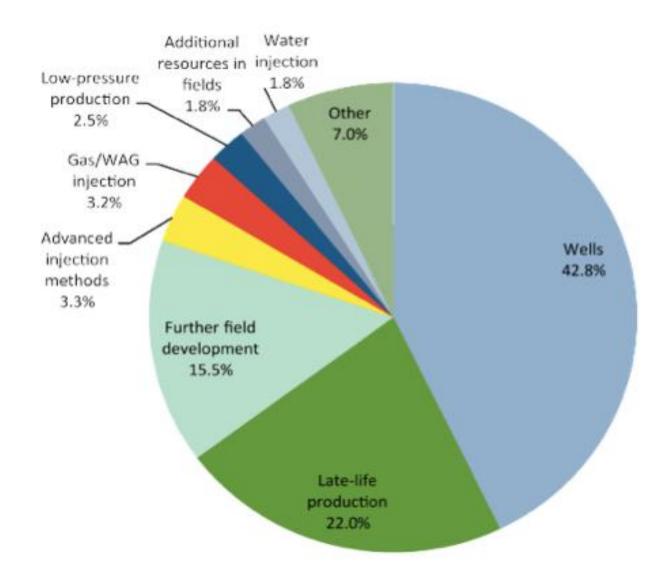






# Reported resources in plans and methods for reserve growth in producing fields





#### Bente Nyland believes in 100 more years of oil



Bente Nyland - Foto: Scanpix

# Bente Nyland tror på 100 oljeår

 Man trodde da man startet opp i Nordsjøen at man skulle være ferdig i 1980, sier oljedirektør.

